ABSTRACT

A method of improvement of toughness of a heat affected zone in a multi-layer welded joint, a fillet welded joint, and a one-pass or several-pass large heat input welded joint of a steel plate is provided, that is, a method of improvement of toughness of a heat affected zone in a welded joint of a steel plate characterized subjecting a surface of a heat affected zone formed by a last pass of a multi-layer welded joint of a steel plate to impacts by an ultrasonic vibration tool or shot peening by ultrasonic vibration steel balls to thereby make an average of longitudinal axis of crystal grains up to a depth of 2 mm or more from the surface of the steel plate in the microstructure adjacent to a fusion line (FL) of a weld metal and a steel plate matrix in said heat affected zone formed by the last pass the equivalent of the crystal grain size of the steel plate matrix before the welding at a depth of 1/4 of a thickness t from the surface of the steel plate.